OBSERVATION OF TWO SQUALL LINES, AUGUST 16, 1954

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This is an eyewitness account of some interesting cloud phenomena associated with two squall lines which passed my farm on August 16, 1954. The farm is located 30 miles northwest of Washington, D. C., near Route 7 or the so-called Leesburg Pike, about 4¼ miles south-southeast of Leesburg, Va. (See fig. 6 of the preceding article by Holleyman and Hand.)

At about 1800 EST Monday, August 16, a squall line passed the farm with strong winds and a dark turbulent cloud. There was no rain with this cloud. About 25 miles farther back to the northwest a second line of clouds with thunder and lightning could be seen approaching. No particular attention was paid to the first cloud which had passed over until about 1845 EST, when a ropelike

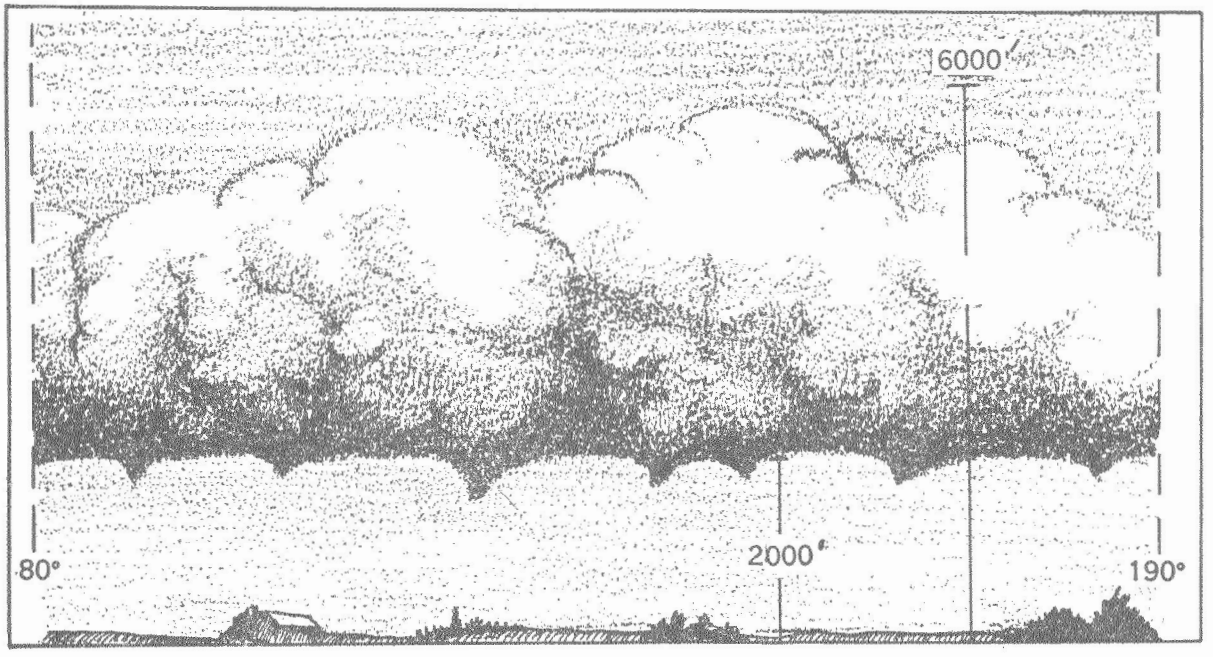

FIGURE 1.—Sketch illustrating the protrusions on the squall line to the southeast of the Brewster farm. Heights of cloud base and top above ground are estimated.

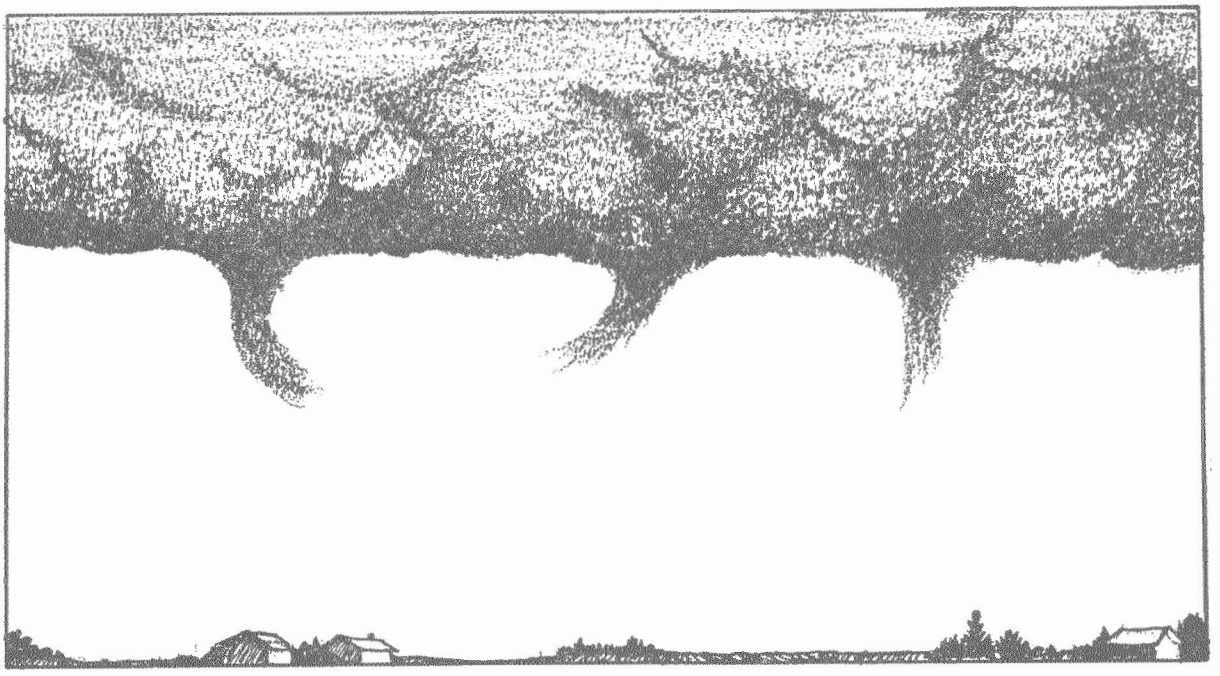

FIGURE 2.—Sketch illustrating the growth of the protrusions.

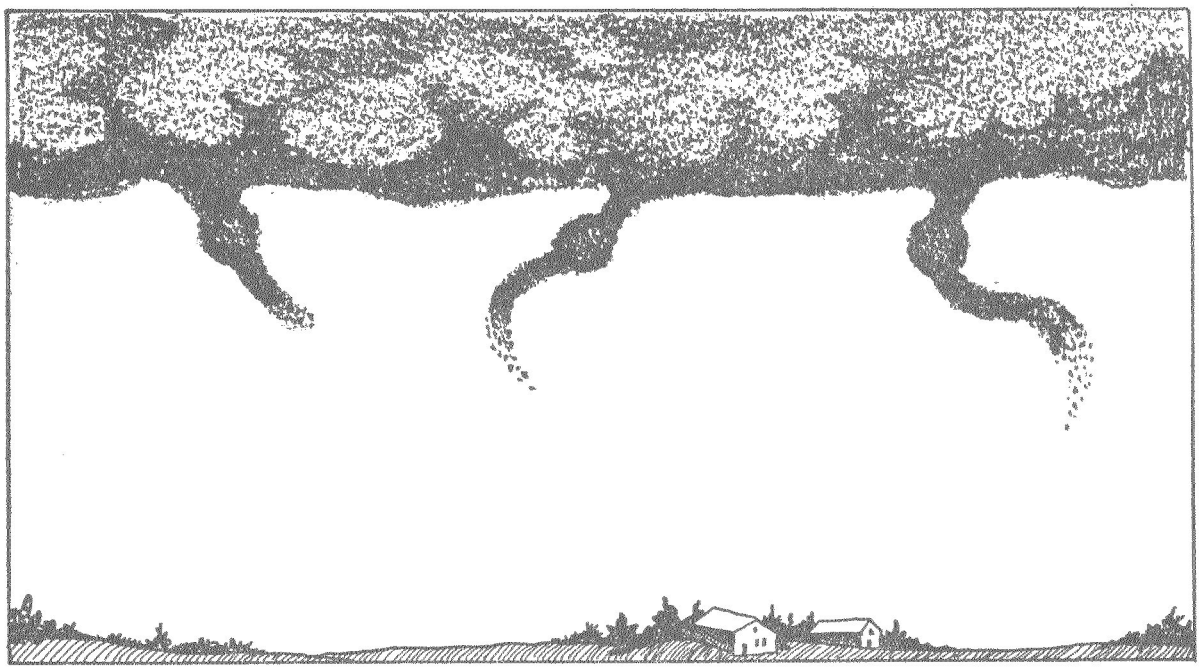

FIGURE 3.—Sketch illustrating the bulges which developed on a few of the ropelike clouds.

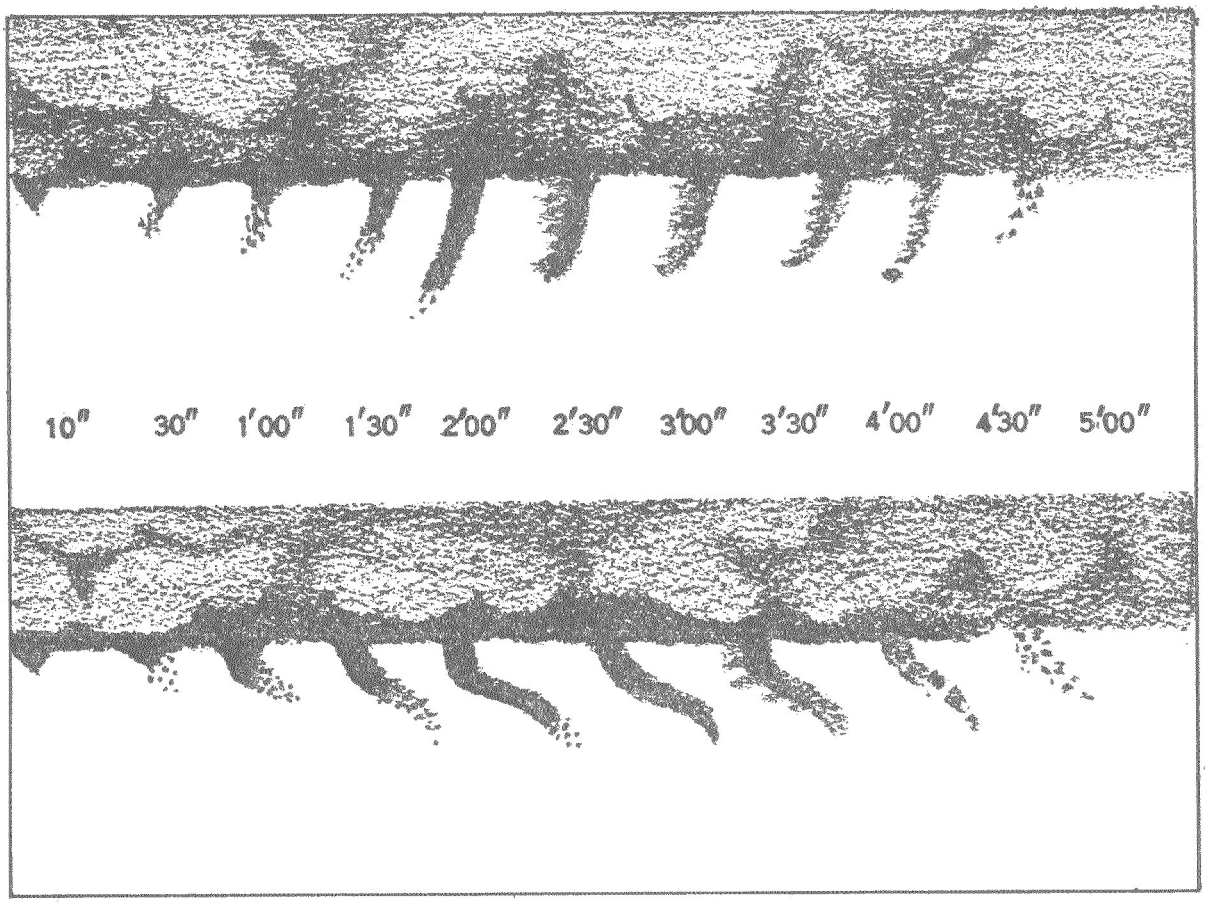

FIGURE 4.—Sketch illustrating life cycle of two typical protrusions. Estimated times are in minutes and seconds.

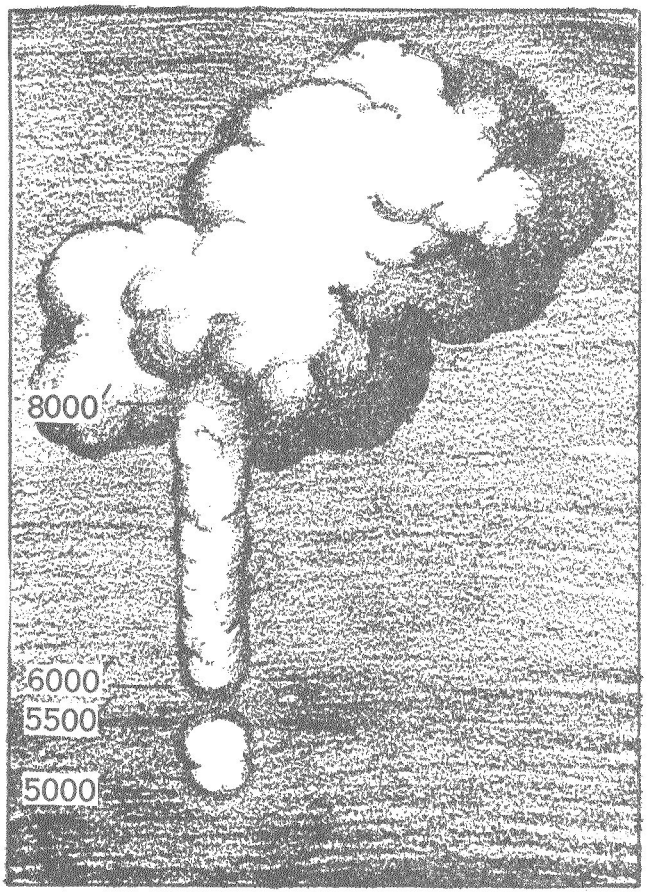

FIGURE 5.—Sketch illustrating unusual column-like formation observed northeast of the Brewster farm. Heights of different parts of formation above ground are estimated.

cloud protruding from it was noticed. At 1900 EST, the second squall line passed with some wind and heavy rain showers.

From the period 1845 to 1900 EST, the first squall line cloud was watched almost continually and at least 10 or possibly 12 ropelike appendages were seen to develop from that cloud. The cloud itself had an estimated base of 2,000 feet, with tops estimated around 6,000 feet. Since the cloud was by now from 15 to 30 miles distant and there were other buildups in the vicinity of the cloud, it could easily be the observed tops were not necessarily directly above this particular cloud. The cloud extended from about 80° to 190° in azimuth as observed from behind. The base of the cloud was very sharp, and small protrusions developed downward southeast of the farm. These protrusions were always pointed at the bottom. (See fig. 1.)

Below a protrusion, sometimes to the right, sometimes directly below it, thin wisps of clouds would appear, gradually thickening and becoming more numerous, so that finally the ropelike appendage would be a solid mass. (See fig. 2.) In some cases, this process would continue below this cloud column, thus making it longer. The average diameter of this ropelike column was estimated to be from 300 to possibly 800 feet. The columns, except in some cases which will be mentioned later, seemed to be fairly uniform in diameter except they were a little wider just at the point where they entered the cloud. That is, the narrower ones were narrow their entire length except just before entering the cloud and the wider ones likewise maintained a fairly uniform diameter throughout. There were a few of these ropelike clouds which developed a bulge at an estimated distance of 200 or 300 feet below the base of the cloud. (See fig. 3.) This bulge extended so that its diameter was perhaps three times the diameter of the original formation. These ropelike formations extended downward an average of possibly 700 or 800 feet. The bottom of each could be seen except in two or three instances where trees blocked the horizon.

After the ropelike cloud formation had been in existence for about 3 minutes, a few wisps of clouds could be seen breaking away from the column, after which there was a rapid dissipation of the column and the base of the large squall cloud would again be perfectly straight. The life cycle of these formations averaged about 5 minutes. Rotation could not be discerned in any of the formations. Figure 4 shows the life cycle of two typical formations.

At one time (about 1900 EST) just before the second line arrived overhead and the heavy rain started, an unusual columnlike formation was observed to the northeast. Near the side of one of the towering cumulonimbus clouds from about 8,000 feet down to 6,000 feet was a white cloud column perhaps 500 feet in diameter with an isolated cloud not any wider than the column and about 500 feet below it. (See fig. 5.) After 3 or 4 minutes this column faded and disappeared and the isolated cloud likewise dissipated.

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